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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/531,529	06/27/2005	Menachem Nathan	1082-1007	1927
82253	7590	03/03/2011		
D. Kligler I.P. Services LTD P.O. Box 25 Zippori, 17910 ISRAEL				
EXAMINER				
SCULLY, STEVEN M				
ART UNIT		PAPER NUMBER		
1727				
NOTIFICATION DATE		DELIVERY MODE		
03/03/2011		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

daniel@dkpat.co.il

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### Office Action Summary

**Application No.**

10/531,529

**Applicant(s)**

NATHAN ET AL.

**Examiner**

Steven Scully

**Art Unit**

1727

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 December 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 51-56 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 51-56 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-912)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**THIN-FILM CATHODE FOR 3-DIMENSIONAL MICROBATTERY AND METHOD FOR  
PREPARING SUCH CATHODE**

Examiner: Scully S.N.: 10/531,529

**DETAILED ACTION**

1. The Amendment filed December 16, 2010 has been entered. Claims 1-50 have been canceled and claims 51-56 are newly added. Accordingly, claims 51-56 are pending examination in the application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 51-55 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification does not reasonably provide support for "a conductive layer comprising a metal element", as the specification specifically requires a transition metal element. Appropriate correction is required.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 51 and 53-55 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Particularly, claim 51 recites "a thin-film cathodic layer comprising a sulfide of the metal element electrochemically formed directly on the conductive layer". It is unclear if the "metal element" of the sulfide is intended to have been a part of the conductive layer's metal element, or is an additional metal element that is electrochemically deposited with the sulfide to form a second layer on top of the conductive layer's metal element. Applicant is asked to clarify. For purposes of compact prosecution, the broadest reasonable interpretation of the claim language is being given.

***Claim Rejections - 35 USC § 103***

7. Claim rejections of claims 26, 29, 30 and 32-38 under 35 U.S.C. 103(a) as being unpatentable over Nathan et al. (US6,197,450) in view of Delnick et al. (US6,316,142) are withdrawn because the claims have been canceled.
8. Claim rejections of claims 26, 29, 30 and 32-38 under 35 U.S.C. 103(a) as being unpatentable over Nathan et al. (US6,197,450) in view of Palmer et al. (US4,416,915) are withdrawn because the claims have been canceled.

9. Claim rejection of claim 31 under 35 U.S.C. 103(a) as being unpatentable over Nathan et al. (US6,197,450) in view of Delnick et al. (US6,316,142) and Rigal et al. (US4,346,153) is withdrawn because the claim has been canceled.

10. Claim rejection of claim 31 under 35 U.S.C. 103(a) as being unpatentable over Nathan et al. (US6,197,450) in view of Palmer et al. (US4,416,915) and Rigal et al. (US4,346,153) is withdrawn because the claim has been canceled.

11. Claims 51, 53-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nathan et al. (US6,197,450).

With respect to claims 51 and 56, Nathan et al. disclose a microbattery, consisting of an anode, an electrolyte and a cathode on a perforated silicon wafer. The perforated conductive substrate includes a plurality of cavities formed therein, wherein the cathodic layer, electrolyte layer and anodic layer are deposited therein. See column 4, line 64-column 5, line 4; Figure 1A. Nathan et al. disclose a cathode material of, for example,  $\text{TiS}_2$ .

Nathan et al. do not disclose the layer sequence as claimed, wherein a thin-film anodic layer is formed directly on a thin-film electrolyte layer formed directly on a thin-film cathodic layer formed directly on a conductive layer formed directly on a substrate (A:E:C:Co:S). However, Nathan et al. disclose a sequence of Co:C:E:A:S, i.e. the anode and cathode are reversed. It would have been obvious to one of ordinary skill in the art at the time of the invention to rearrange the anode and cathode, since it has

been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

With respect to claim 53, Nathan et al. disclose the cathode to have a thickness of a few microns. See column 4, lines 43-53.

With respect to claims 54, Nathan et al. disclose the substrate material is made of a single crystal or amorphous material and is selected from glass, alumina, semiconductor materials for use in microelectronics, or ceramic materials, and the substrate material is preferably silicon. See column 3, lines 25-34.

With respect to claim 55, Nathan et al. disclose the substrate is provided with a plurality of cavities with the anode, cathode, solid electrolyte layers and optional current collector layer being also deposited throughout the inner surface of the cavities. See claims 1 and 8.

### ***Response to Arguments***

Applicant's arguments filed December 16, 2010 have been fully considered but they are not persuasive. Applicant argues:

a) *Claim 51 is allowable over the prior art because it recites "the conductive layer comprises an electrochemically-formed sulfide of the same metal element".*

The Examiner respectfully disagrees. As discussed above with respect to the rejection under 35 U.S.C. 112, second paragraph, it is unclear whether or not the metal element of claim 51's conductive layer is actually part of the metal element used in making the sulfide of the metal element that is formed directly on the conductive layer.

It has been interpreted that a metal (for example Cu) having a metal sulfide (for example CuS) layer thereon would meet the claim limitations.

*b) The ordering of the layers is the reverse of microbatteries of this sort that were known in the art.*

While the Examiner recognizes such, it is the position of the examiner that the modification would have been an obvious rearrangement of parts where the electrodes are switched (such as an "inside-out" battery), absent persuasive evidence otherwise.

### ***Conclusion***

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Contact/Correspondence Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Scully whose telephone number is (571)270-5267. The examiner can normally be reached on Monday to Friday 7:30am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571)272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. S./  
Examiner, Art Unit 1727

/Dah-Wei D. Yuan/  
Supervisory Patent Examiner, Art Unit 1727